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Space Administration

**MEASUREMENT
SYSTEM
IDENTIFICATION
U.S. STANDARD UNITS**

MSFC-SPEC-2491
REVISION A
EFFECTIVE DATE: February 4, 2014

George C. Marshall Space Flight Center
Marshall Space Flight Center, Alabama 35812

EM40

MSFC TECHNICAL STANDARD

CLEANER, AQUEOUS

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DOCUMENT HISTORY LOG

| Status (Baseline/ Revision/ Canceled) | Document Revision | Effective Date | Description |
|--|----------------------|----------------------------|--|
| Baseline | | | BASELINE INITIAL RELEASE |
| CHG 1 | SCN 001 | SB3-01-5391 SM3-01-5544 | Remove MSFC-QPL-2491 from MSFC-SPEC-2491. The QPL will be baselined as a stand alone doc. |
| Revision | A | 2/4/2014 | Revision A release was authorized by the MSFC Technical Standards Document Control Board (DCB) through the Multiprogram Document Management System (MPDMS). Update specification in entirety with changes to correct pH solution requirement, change supplier name and update to new format. |

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1.0 SCOPE

This specification established the requirements for an environmentally compliant hand wipe cleaner. Refer to MSFC-QPL-2491 for a list of qualified materials which conform to these specification requirements. This specification has been approved by the George C. Marshall Space Flight Center (MSFC) and is available for use by MSFC and associated contractors.

2.0 APPLICABLE DOCUMENTS

2.1 GOVERNMENT DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on date of invitation for bids or requests for proposals shall apply.

SPECIFICATIONS

MSFC

MSFC-QPL-2491 Qualified Products List, Products Qualified Under George C. Marshall Space Flight Center Specification MSFC-SPEC-2491, Cleaner, Aqueous

STANDARDS

MILITARY

MIL-STD-129 Department of Defense Standard Practice, Military Marking for Shipment and Storage

(Copies of specifications, standards, drawings, and publications required by suppliers in connection with specific procurement functions should be obtained from the procuring activity as directed by contracting officer.)

2.2 NON-GOVERNMENT DOCUMENTS

The following documents form a part of this specification to the extent specified herein. Unless otherwise indicated, the issue in effect on the date of invitation for bids or request for proposals shall apply.

STANDARDS

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D501 Sampling and Chemical Analysis of Alkaline Detergents, Standard Test Methods of

(Application for copies should be addressed <http://www.astm.org/>.)

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3.0 REQUIREMENTS

3.1 MATERIAL

The cleaner shall be aqueous based and shall meet the requirements of this specification.

3.2. PHYSICAL PROPERTIES

Physical properties of the cleaner shall be in accordance with Table I.

TABLE I. Cleaner Requirements

| Property | Requirement | Test Paragraph |
|---|-----------------------------------|----------------|
| Active Na ₂ O (Sodium Oxide) | (Full Strength) 0.85 to 1.25% wt | 4.7.1.1 |
| Total Na ₂ O (Sodium Oxide) | (Full Strength) 1.05 – 1.45% wt | 4.7.1.2 |
| Specific Gravity @ 25C | (Full Strength) 1.03 – 1.04 | 4.7.1.3 |
| Aluminum Safety | No sign of white rust or blushing | 4.7.1.4 |
| pH (1%) @ 25C | 10.9 +/- 0.3 | 4.7.1.5 |

3.3 APPEARANCE

The cleaner shall be visually inspected with the unaided eye (corrective lenses permitted). The cleaner shall be a clear green liquid, free of foreign material.

3.4 SHELF LIFE AND STORAGE

The cleaner shall be stored at 40°F to 120°F in the original sealed containers in a closed and vented facility away from direct sun or rain (see 5.3). The storage life under these conditions shall be 12 months from date manufacture.

3.5 TOXIC PRODUCTS AND SAFETY

The Vendor shall furnish a Material Safety Data Sheet (MSDS) to the procuring activity.

3.6 SHELF LIFE EXTENSION REQUIREMENTS (APPLICABLE TO THE PROCURING ACTIVITY ONLY)

Extending the shelf life of this material is not permitted.

4.0 VERIFICATION

4.1 IN-PROCESS MATERIAL (APPLICABLE TO USERS)

When the vendor container is opened at the user's site, the material is regarded as in-process material. In-process material can be used up to its certified shelf life provided that normal precautions are taken for handling and storage, including those precautions cited below.

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- a. When in-process material is not in use, the material's container shall be closed immediately in a manner as closely as possible to its original state. Opening of containers for inspection of contents shall be limited to less than ten (10) minutes.
- b. Said container shall be stored in a safety approved location within a vented facility, away from direct sun or rain.
- c. For a given work station, opened containers shall be used to exhaustion before another vendor container of the material is opened for use at the station.
- d. If the integrity of in-process material is at any time suspect (e.g. not free flowing or failure of visual inspection criteria), then the material in question shall be discarded.

4.2 GENERAL PROVISIONS

The vendor shall provide and maintain a quality control system in accordance with the requirements of the purchase document. Vendors shall only submit those materials which meet the requirements of this specification.

4.3 RESPONSIBILITY FOR INSPECTION AND TEST

4.3.1 Vendor

The vendor is responsible for the performance of all inspection and test requirements as specified herein. Unless otherwise indicated, the vendor may utilize his own or any other inspection facilities and services acceptable to the procuring activity. Records of the examination and tests shall be transported to the procuring activity with the material.

The vendor shall notify the procuring activity of any changes in formulation or procedures used in product manufacture.

4.3.2 Procuring Activity

The procuring activity is responsible for verifying acceptability of the vendor test data or vendor certifications of selected acceptance tests.

4.4 QUALIFICATION TESTS (SEE ALSO 6.3.1)

Qualification testing shall consist of all examinations and tests specified in Table II and III and any other tests as deemed necessary by the MSFC Materials and Processes Laboratory. The test data shall be submitted to the procuring activity. The lots subjected to the qualification tests shall be representative of the manufactured lot from the proposed production facility.

4.5 QUALITY CONFORMANCE TESTS (SEE ALSO 6.3.2)

4.5.1 Vendor Tests

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The following tests specified in Table II are inspection tests for this specification which are to be performed by the vendor and reported to the procuring activity along with certifications of compliance to the requirements below.

Table II. VENDOR TESTS

| Examination or Test | Requirement Paragraph | Examination or Test Paragraph |
|----------------------------|------------------------------|--------------------------------------|
| Active Na ₂ O | 3.2 | 4.7.1.1 |
| Total Na ₂ O | 3.2 | 4.7.1.2 |
| Specific Gravity | 3.2 | 4.7.1.3 |
| pH | 3.2 | 4.7.1.5 |

4.5.2 Vendor Certifications

The vendor shall supply certifications of compliance for the tests in Table III.

Table III. CERTIFICATION REQUIREMENTS

| Examination or Test | Requirement Paragraph | Examination or Test Paragraph |
|----------------------------|------------------------------|--------------------------------------|
| Aluminum Safety | 3.2 | 4.7.1.4 |
| Appearance | 3.3 | 3.3 |

4.6 SAMPLING

A sample of sufficient size to perform the required tests shall be randomly selected from each lot.

4.7 TEST METHODS

The following test methods and procedures shall be used. Unless otherwise specified in the test or procedure description, all weights, volumes, and temperatures shall be measured to the nearest specified unit or decimal. When a referenced document provides the test method description, that document applies only to the extent of specifying the method.

NOTE: Unless otherwise specified within this specification, reagent grade chemicals shall be used for chemical reactions in the conduct of all tests defined in this specification. Solvents and indicators may be commercial nonreagent grade materials unless otherwise specified with this specification.

4.7.1 Properties Tests

4.7.1.1 Active Na₂O

Active Na₂O (Sodium Oxide) shall be determined per ASTM D501.

4.7.1.2 Total Na₂O

Total Na₂O (Sodium Oxide) shall be determined per ASTM D501.

4.7.1.3 Specific Gravity

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Specific gravity shall be determined using a gravimetric method at 25°C +/-1°C.

4.7.1.4 Aluminum Safety

Concentrated cleaner shall be tested on an unclad 2024 specimen (any temper between 65°F and 140°F for five minutes minimum.

4.7.1.5 pH

pH shall be determined using suitable equipment on cleaner formulations that are 1% solutions of the product form being procured. To perform the pH tests, mix 1 part cleaner to 99 +/- 5 parts Deionized water.

4.8 REJECTION

Failure to meet any requirements of this specification is cause for rejection.

5.0 PACKAGING

5.1 PACKAGING AND PACKING

Packaging and packing of the cleaner material shall be in accordance with standard commercial practice in conformance to federal and state regulations applicable to the type of material. Containers in the same shipment shall be of the same size and of such construction and materials that the cleaner material will be adequately protected against loss or contamination.

5.2 MARKING

Each container shall be marked for identification and shipment in accordance with MIL-STD-129 and shall include the following:

- a. Specification number and revision level
- b. Manufacturer's name, lot identification, and material identification
- c. Purchase document number
- d. Date of manufacture
- e. Storage temperature range.

5.3 STORAGE

After receipt of the material, the procuring activity is responsible for storage.

6.0 NOTES

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6.1 INTENDED USE

The material shall be used as a cleaner for flight or associated hardware.

6.2 ORDERING DATA

Purchase documents should specify the following:

- a. Title, number, and revision letter of this specification
- b. Types and quantity of material required

This specification requires procurement from vendors who are listed on the QPL for this specification.

6.3 DEFINITIONS

6.3.1 Qualification Tests

Qualification tests are those tests necessary to qualify a supplier as an approved source. Once the material is qualified, these tests need not be repeated, provided the formulation or process of manufacturer does not change.

6.3.2 Quality Conformance Tests

Quality conformance tests are those tests performed on each lot of material to verify compliance with specification requirements.

6.3.3 Lot

A lot shall consist of all material manufactured in the same production shift, from the same raw materials and by the same manufacturing process and submitted for acceptance at one time.

6.4 MODIFICATIONS OR CHANGES

Recommendations for modifications or changes to the requirements specified herein shall be submitted in writing to the Materials and Processes Laboratory at MSFC for consideration.

6.5 TYPICAL MATERIAL

Prime Cleaner (Formula number 03360-00) manufactured by DuBois Chemicals, Inc is typical of the material covered by this specification.

NOTICE: When Government drawings, specifications, or other data are used for any purpose other than in connection with a definitely related Government procurement operation, the United States Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use or sell any patented invention that may in any way be related thereto.